

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

By this Amendment, claims 1, 10, 12, and 13 have been amended, claims 14 and 15 have been canceled, and claim 16 has been added. Support for the amendments to claims 1, 10, and 12 can be found, for example, in the specification at page 18, lines 23-27. Support for new claim 16 can be found, for example, in the specification at page 26, line 25, through page 28, line 15. Claim 13 has been amended solely to address matters of form. No new matter has been added. Accordingly, claims 1-13 and 16 will be pending herein upon entry of this Amendment. For at least the reasons below, Applicant respectfully submits that this application is in condition for allowance.

In the Office Action mailed June 13, 2008, claims 12 and 13 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter; claims 1, 2, 10, 12, and 14 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,050,227 to Furusawa et al. ("Furusawa"); claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa in view of U.S. Patent No. 7,167,595 to Hiroshige et al. ("Hiroshige"); claims 4, 5, 11, 13, and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa in view of U.S. Patent No. 6,798,422 to Wang ("Wang"); claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa in view Wang and European Patent Application No. 0 686 941 to Morimoto ("Morimoto"); claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa in view of Wang and Hiroshige; and claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Furusawa in view of Wang, Hiroshige, and U.S.

Patent No. 5,870,504 to Nemoto et al. ("Nemoto"). To the extent that these rejections might still be applied to the claims currently pending in this application, they are respectfully traversed.

Claim 1 is patentable over the cited portions of Furusawa since Furusawa does not disclose, teach, or suggest an image processor including, *inter alia*, detection means for automatically detecting a connected sequence of pixel drawing regions making up an edge in the image drawn by the drawing means by applying an edge extraction filter, as recited in the claim. As a result, claim 1 is patentable over Furusawa.

Furusawa teaches a method and apparatus for image smoothing along a tangential direction of a contour including the steps as generally indicated in Figure 2 of Furusawa. In brief, an image is acquired from a magnetic disk and is displayed on a color monitor *for viewing by an operator* prior to any processing (see steps S1, S2, and corresponding discussion in col. 4, lines 1-13). In step S3 and as further described in col. 4, lines 14-42, an operator physically performs the step of designating the area to be processed and must manually locate the general region of a contour to be smoothed. In subsequent steps, the designated region is further processed by determining the contour direction and such. Notably, however, Furusawa does not disclose automatically detecting a connected sequence of pixel drawing regions by applying an edge extraction filter.

Even assuming for the sake of argument that the contour detection of Furusawa corresponds to the claimed detecting of the relative orientation of a connected sequence of pixel drawing regions by means of selecting out one relative orientation detection filter (which Applicant maintains that it does not), Furusawa still lacks the feature of automatically detecting a

connected sequence by applying an edge extraction filter. For at least these reasons, claim 1 is patentable over Furusawa.

Claim 2 is patentable over Furusawa at least by virtue of its dependency from claim 1 and for the additional features recited therein. Claims 10 and 12 have been amended to include similar features as amended claim 1 and are likewise patentable for at least the same reasons as discussed above with respect to claim 1. Claim 14 has been canceled and its rejection is therefore moot.

With regard to claim 4, Applicant respectfully submits that Furusawa and Wang do not disclose the claim, alone or in combination. The Examiner acknowledges that Furusawa does not disclose the claimed performing of interpolation with the relative orientations specified by the selected relative orientation detection filters. The Examiner then refers to a single paragraph in Wang (col. 6, lines 12-19) for the concept of performing interpolation. Applicant respectfully submits that the cited portions of Wang do not cure the deficiencies of Furusawa and, therefore, the rejection must be withdrawn.

Claim 4 recites that interpolation is performed with the relative orientations specified by the selected relative orientation detection filters. Further, the selected relative orientation detection filters represent "a predetermined number of relative orientation detection filters each representing a distinguishing feature that is closer to the distinguishing feature of the connected sequence of pixel drawing regions." Wang does not disclose each of these features. Wang does not disclose, teach, or suggest *selecting a predetermined number of* relative orientation detection filters based on a feature that is closer to a feature of the connected sequence of pixel drawing regions. Wang is further silent with regard to interpolation of the relative orientations specified

by those selected filters. As best understood, Wang simply looks at the orientations of various surrounding pixels and determines whether it is appropriate to interpolate an *image edge* (see col. 6, lines 12-19). As is further described, any analysis that is done to determine an edge orientation is done *before* interpolation: "edge direction filtering is important so that wrong or inaccurate directions can be removed from the edge orientation map *before* the map is used for interpolation." (*Id.*) Thus, any interpolation that is done in Wang is not related to acquiring a relative orientation of a particular pixel or connected sequence of pixels but is instead done after the edge orientation is established. Thus, Wang clearly does not disclose, teach, or suggest at least the selecting or performing interpolation features recited in claim 4. As a result, claim 4 is patentable over Furusawa and Wang, alone or in combination.

Claim 5 is patentable over Furusawa and Wang at least by virtue of its dependency from claim 4 and for the additional features recited therein. In particular, the references do not disclose selecting out a predetermined number of relative orientation detection filters for which their respective convolution results in a single direction exceed a predetermined threshold value and yield the largest result, the second largest result, and the third largest result, respectively, as the relative orientation filters having their respective distinguishing features that are closer to the distinguishing feature in the subject direction, and distributing, using interpolation, the relative orientations specified by the selected relative orientation detection filters, thereby determining one relative orientation.

The Examiner's reasoning regarding claim 5 is entirely unclear. The terms of the claim recite that filters having convolutions with the largest, second largest, and third largest results are selected. Thus, at least three filters are selected. The Examiner seems to indicate that a single

filter of Furusawa inherently contains the three largest values and therefore teaches the claim. This interpretation ignores the claim language that recites that the selected filters have “respective convolution results” yielding the “largest result, the second largest result, and the third largest result, respectively.” Clearly, a single filter can only represent a single convolution result, not three. In addition, there is nothing to suggest in Furusawa that interpolation is used to distribute the relative orientations specified by this predetermined number of filters to determine one relative orientation and, as discussed above with regard to claim 4, Wang does not cure this deficiency.

Claim 16 has been added as depending from claim 5 to further emphasize these features. As recited, the interpolation is carried out using a series of equations configured to fit a parabola onto the three largest convolution results and to then find the maximum value (B) of the parabola. This maximum value represents the interpolated relative orientation of a particular pixel drawing region. Support for new claim 16 can be found, for example, at page 26, line 25, through page 28, line 15, and in Figures 15 and 16. The cited references clearly do not disclose, teach, or suggest, this claim.

Claims 11 and 13 recite similar features as recited in claim 4 regarding selecting a plurality of relative orientation detection filters and performing interpolation with the relative orientations specified by them. Accordingly, for the same reasons as discussed above with respect to claim 4, claims 11 and 13 are patentable over Furusawa and Wang, alone or in combination. Claim 15 has been canceled and its rejection is therefore moot.

Claim 3 is patentable over Furusawa and Hiroshige at least by virtue of its dependency from claim 1 and for the additional features recited therein. Hiroshige does not cure the above-

mentioned deficiencies of Furusawa. The Examiner cites Hiroshige for various smoothing features. Clearly, Hiroshige does not disclose, teach, or suggest the automatic detection by applying an edge extraction filter lacking in Furusawa as discussed above. As a result, claim 3 is allowable.

Claim 6 and 7 are patentable over Furusawa, Wang, and Hiroshige at least by virtue of their dependency from claims 1, 4, and 5 and for the additional features recited therein. Hiroshige does not cure the above-mentioned deficiencies of Furusawa and Wang. The Examiner cites Hiroshige for various smoothing features. Clearly, Hiroshige does not disclose, teach, or suggest the selecting and interpolating features lacking in Furusawa and Wang as discussed above. Further, the Examiner's rationale supporting the combination is flawed. The Examiner simply states that the combination would have been obvious to provide a "different smoothing method." This motivation is facially insufficient as failing to provide any coherent and logical reason why one of skill in the art would make the combination. By that rationale, any combination would be obvious simply because it is "different." Applicant respectfully submits, therefore, that the rejections must be withdrawn.

Claim 8 is patentable over Furusawa, Wang, Hiroshige, and Nemoto at least by virtue of its dependency from claims 4, 5 and 8 and for the additional features recited therein. Nemoto does not cure the above-mentioned deficiencies of Furusawa, Wang, and Hiroshige. The Examiner cites Nemoto for the teaching of normalization. Clearly, Nemoto does not disclose, teach, or suggest the selecting and interpolating features lacking in Furusawa, Wang, and Hiroshige as discussed above. As a result, claim 8 is allowable.

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Claim 9 is patentable over Furusawa, Wang, and Morimoto at least by virtue of its dependency from claims 4 and 5 and for the additional features recited therein. Morimoto does not cure the above-mentioned deficiencies of Furusawa and Wang. The Examiner cites Morimoto for teachings related to smoothing. Clearly, Morimoto does not disclose, teach, or suggest the selecting and interpolating features lacking in Furusawa and Wang as discussed above. As a result, claim 9 is allowable.

In view of the foregoing all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone Applicant's undersigned representative at the number listed below.


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